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PROBLEMS OF LAND TENURE IN RELATION TO LAND-USE ADJUSTMENTS

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PROBLEMS OF LAND TENURE IN RELATION TO LAND-USE ADJUSTMENTS

Summary

In wide sections of the Corn Belt, certain types of landlord-tenant arrangements are inherently inimical to the objectives of long-time land-use adjustment and soil conservation policies. The present study undertaken by the Iowa Agricultural Experiment Station, the Soil Conservation Service, and the Resettlement Administration, in the Tarkio Creek Erosion Control Demonstration Area in southwestern Iowa, attempts to analyze the effects of various forms of land tenure on land-use patterns and related farming practices. This highly complex problem is studied from the viewpoint of group behavior of farmers under specified conditions of land types and institutional arrangements rather than from the viewpoint of individual farm management.

In order roughly to measure the effects of certain factors on land use and erosion, criteria have been developed to indicate crop systems, livestock systems, topography and state of erosion in numerical terms, and the various farmers have been classified into owner-operators, "family-tenants" related to landlord, and "non-related" tenants, and these tenancy groups subclassified by lease types and various other leasing arrangements.

Comparing owner-operatorship with tenancy in general, it appears that land is less exploitively used and suffers less from erosion under the former than under the latter form of tenure. Studying the situation more in detail, however, interesting exceptions to this generalization are revealed. Related tenants follow practically the same land-use patterns as owner-operators, regardless of lease type, and have only slightly higher degrees of erosion on their land. Of the non-related tenants, those renting land under stock-share leases use crop systems similar to those of owner-operators and their land is in a relatively high state of fertility. This leaves the farms operated by "non-related" tenants under crop share and cash rent leases as the tenure group where the heaviest land exploitation and the highest degree of erosion is found.

The type of landlord, his occupation, his rural or urban background, his intent of ownership and the distance of his residence from the farm are all important factors influencing the character of leasing arrangements and the security of tenure. In analyzing these various factors and their interrelations, a highly significant fact is revealed: it is not the actual length of past occupancy of a farm

by an operator, but his anticipated security of occupancy, which determines land use and degree of soil conservation. A tenant may have been on the same farm for ten years, but in none of these years did he know before fall whether he could stay for the next year; the character of land use on his farm is almost necessarily exploitive. Another tenant may have been on the farm for only a few years, but he knows he can stay indefinitely; his interest in maintaining the productivity of the land is based on the anticipated continuancy of his tenure.

The changes in the tenure pattern over a ten-year period (1926-1935) in the area studied indicate a serious decline in the degree of security of land tenure. The percentage of owner-operated farms decreased from 66 to 45 percent; the percentage of farms operated under crop-share leases increased from 19 to 33 percent. The proportion of all tenants related to their landlords was considerably smaller in 1935 than in 1926. This decrease in the security of tenure is typical for large sections of the Corn Belt, and it seriously handicaps any policy designed to bring about land-use adjustments and soil conservation. A comprehensive land-use program in the Corn Belt cannot escape the stubborn resistance offered by the inherently exploitive tenure system to desirable adjustments, and must face this problem by developing effective means to improve permanently the prevailing tenure arrangements.

PROBLEMS OF LAND TENURE IN RELATION TO LAND-USE ADJUSTMENTS [1]

I. Introduction

The land tenure situation in Iowa is becoming a more and more serious handicap to the accomplishment of land-use adjustments and to the sound development of farm and rural community life. The Soil Conservation Service in its demonstration areas, as well as the past A.A.A. programs, in the State as a whole have encountered many difficulties on tenant-operated farms arising out of certain landlord-tenant arrangements which are inherently inimical to the objectives of long-time land-use adjustments. A comprehensive conservational land-use program cannot afford to neglect the tenancy problem wherever a large proportion of the farms is tenant-operated. Effective means must be developed to facilitate desirable land-use adjustments on tenant farms by permanently improving landlord-tenant relationships.

A. Purpose of this Study

The purpose of this study is to obtain a clear understanding of the effects of various forms of land tenure on land-

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1/ This paper represents a technical discussion of the land tenure phase of the social and economic survey in the Tarkio Creek Erosion Control Demonstration Area in southern Iowa, in which the Iowa Agricultural Experiment Station, the University of Missouri, and the Soil Conservation Service cooperated. A complete report on the whole study comprising phases other than the land tenure problem, and including an abstract of the present report will be published as an Iowa Experiment Station bulletin in the spring of next year.

The senior author is Land-Use Planning Specialist for Iowa of the Land Utilization Divisions of the Resettlement Administration. The junior author is with the Soil Conservation Service. He interviewed the farmers and obtained the records upon which this study is based.

The writers are greatly indebted to Mr. A. J. Englehorn, Assistant Land-Use Planning Specialist of the Resettlement Administration, for constructive criticism and many valuable suggestions.

use patterns and related farming practices. 2/

Regarding land use in its effect on erosion, there are three important criteria which largely determine the relative degree of erosion and soil depletion on a given land class: (a) the proportion of the crop land in intertilled crops, particularly corn; (b) the proportion of the crop land in grasses and legumes; and (c) the proportion of the total farm land under permanent vegetative cover, i. e., permanent pasture and timber. This study is an attempt to measure, in quantitative terms, wherever possible, the influence of certain common lease types and other tenure conditions upon these criteria, and ultimately upon the status of erosion on the respective farms.

There are other factors than those just mentioned, which also affect the rate of soil deterioration, and which comprise farming practices directly or indirectly affecting organic matter and plant nutrient content of the soil. Where erosion has attained serious dimensions, the reduction of amount and velocity of the water run-off becomes of greatest importance. Because organic matter increases infiltration rate and waterholding capacity and promotes a vigorous plant growth, all practices affecting the organic matter content of the soil bear directly on the erosion problem. Besides crop residues, the most important source of organic matter on the farm is manure, and the supply of manure is dependent upon the volume of the livestock enterprise, particularly of the roughage-consuming livestock. Hence, the density of the livestock population is a serviceable indicator of the manure base of certain groups of farms. As the character of the livestock enterprises is very decidedly influenced by tenure conditions, some important criteria of livestock systems have been included in the analysis.

It should be emphasized that all these factors are analyzed from the viewpoint of group behavior of farmers under specified conditions of land types and institutional arrangements, and

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2/ The survey schedules also contain valuable information on mortgage indebtedness, tax burdens, living standards and other sociological conditions. The analysis of these facts is reserved for a later report. Some of these factors are discussed in "Economic Phases of Erosion Control in Southern Iowa and Northern Missouri", by Schickele, Himmel and Hurd, Iowa Agricultural Experiment Station Bulletin 333, which is based on a similar survey in the Big Creek Erosion Control Demonstration Area.

not from the viewpoint of individual farm management.

More specifically, therefore, this study attempts to answer the question: in what directions, and to what extent, do tenure conditions influence crop and livestock systems and ultimately the state of productive capacity of the land?

The answer to this question cannot fail to contribute a great deal to the development of a long-time land-use adjustment program with the objective of conserving the natural land resources -- not for the sake of conservation per se, but for the sake of a balanced and progressive development of rural life.

B. Source of Material

In the summer of 1935, a farm-to-farm survey in carefully selected sample blocks in the Tarkio Creek Watershed Area of the Soil Conservation Service was undertaken as a cooperative research project of the Iowa Agricultural Experiment Station and the Soil Conservation Service. 3/ The demonstration area comprises parts of Page and Montgomery counties in southwestern Iowa, and Atchison county in northwestern Missouri, with headquarters in Shenandoah, Iowa. This area is highly representative of a large section of the Missouri Loess area.

The farms surveyed, 253 in number, doubtless present a typical cross-section of the farming conditions in this area. Any selectivity according to personality of the operator was avoided by contacting all farmers in the sample blocks, whether or not they cooperated with the Soil Conservation Service, whether they were friendly or grudgingly disinterested, progressive or dull. The enumerator, an experienced interviewer of farmers, spared no efforts in persuasion, and only rarely failed to obtain the needed information.

Besides recording basic data on land use, crop acreages and livestock enterprises for a "normal" period preceding and including 1933, and for 1935, the crop land on all farms was rated according to five classes of topography (1 = level, to 5 = rough), and five classes of apparent erosion (1 = no erosion, to 5 = severe gully and sheet erosion). The center rating, 3, represents,

3/ In 1934, a similar survey had been made in the Big Creek Area in Decatur and Ringgold counties, Iowa, and Harrison county, Missouri, the results of which are published in Iowa Agricultural Experiment Station Bulletin 333.

theoretically, the average degree of slope or of erosion for the crop land area surveyed. The fact that the weighted average ratings for topography and erosion of the crop land for all farms surveyed are the same, 2.96, (See Table 1) and fall very close to the theoretical average of 3, suggests a fairly high degree of accuracy in the classification. These topography and erosion ratings are of great help in evaluating the effect of crop systems and related farming practices on erosion, as will be seen later.

C. Some Comments on the Method of Analysis

If one specific factor, or one set of closely related factors, is to be segregated in its effect on such a complex situation as a farm, the effect of vast numbers of different kinds of other factors must be controlled or held constant. Many of these factors cannot be adequately expressed in numerical terms. Many of them are multifariously interrelated with one another. The only mathematical approach available to handle material of such character is the analysis of variance. It was felt, however, that before attempting accurately to measure the quantitative effects of so many interrelated and complex factors, and exploratory study of the general characteristics of these factors and of the order of magnitude of their specific effects would be desirable and would perhaps furnish results sufficiently accurate to be used as a basis for formulating policies.

By careful grouping and subgrouping of farms according to clearly defined criteria, it is possible approximately to segregate the influence of specific factors, provided the number of cases in any sub-group does not fall too low. Empirical experience with material of such character as is used in the present study would indicate (as a rough thumb rule) that between 10 to 15 cases represent about a minimum of cases necessary to cancel out the effects of strictly personal and managerial differences between individual farmers in the group average. In general, it can be stated that the more consistently a certain relation between two factors appears throughout all groupings down into small sub-groups of only a few cases each, the stronger this relation is, overshadowing all other interfering factors.

For instance, comparing the proportion of crop land in corn on owner and on tenant farms, the relation between tenant farms and high proportion in corn appears consistently through all groupings by topography and farm size classes, even though the number of cases in some of these classes is only 4 or 5. The degree of consistency with which certain relations appear throughout the

groups and sub-groups of farms has been carefully observed in this study, and has been used as a basis for determining the degree of reliance to be placed on the various conclusions derived from the respective data.

II. Influence of Various Types of Tenure on Land Use and Erosion

A. Topography in Relation to Tenure, Land Use and Erosion

Before discussing the effects of specific types of tenure, a general appraisal of the influence of topography on farming conditions is desirable.

For the purpose of analysis, all farms are divided into two topography classes: (1) those on "rolling land" with a topography rating of 3 or above, and (2) those on "level land" with a rating below 3. The fact that the average rating of the farms on "level" land is 2.44 indicates that most of these farms are "gently rolling", class 2, rather than "level", class 1.

Topography directly affects the degree of erosion. Soil type, cover crop, soil management and climate remaining the same, the degree and length of slope largely determine variations in the rate of erosion. Since the area is fairly homogeneous with respect to soil conditions and climate, it can be assumed that on the average the degree of erosion on land in intertilled crops, for example, is a direct function of the degree and length of slope. Hence, if the erosion rating is higher than the corresponding topography rating for a given group of farms, crop systems and soil management practices are probably more exploitive and cause relatively more erosion than is true of the average farm of the same topography in the area. Conversely, if the erosion rating is lower than the topography rating, less than average erosion is indicated. Note that for all farms the average ratings for erosion and topography are identical. (Table 1)

According to Table 1 the erosion rating is lower than the topography rating on the rolling land while it is higher on the level land. This suggests that farming practices of a relatively more conservational nature are followed on the rolling than on the level to gently rolling land. 4/ The position of the erosion rating relative to the corresponding topography rating shall be referred to

4/ This is in contrast with the Big Creek Area where the rolling land seems to be even more severely exploited than the more level land. See Iowa Experiment Station Bulletin 333.

in the following pages as "relative degree of erosion".

Table 1. Farm Size, Erosion, and Crop System by Classes of Topography

Classes of Topography	Number of Farms	Percent of farms tenant operated(a)	Average Farm Size (A.)	Rating of Topography	Rating of Erosion	Percentage of Farm Land in Permanent Pasture	Percentage of Crop Land in Corn and Soybeans	Percentage of Crop Land in Grasses and Legumes
Farms on:								
Rolling land	157	35	223	3.22	3.18	13	58	21
Level land	96	31	186	2.44	2.51	15	62	16
All land	253	33	209	2.96	2.96	14	59	19

(a) Includes only tenants not related to their landlords. For explanation see below.

The general character of topography in the area is relatively homogeneous. Differences in farming conditions between the two topography classes are not of major importance. So are owner and tenant farms rather equally distributed over these two classes. Some noteworthy tendencies seem to prevail, however, in the relationship between topography and farming conditions.

The average farm size tends to be larger on the rolling than on the level land (223 acres as against 186 acres).5/ This tends to facilitate erosion control since, in this area, conservational extensive crop rotations can usually be followed more readily on large than on small farms. In general, inadequacy of farm size in relation to land and its proper use, so outstanding in the Iowa Loess area, is practically non-existent in the Missouri Loess area.

The crop systems followed on the farms in these two topography classes furnish some explanation for the relatively lower degree of erosion on rolling land as mentioned above. Even though there is only slightly less corn in percent of crop land on the

5/ In contrast with the Big Creek Area where the opposite relationship seems to prevail. See Iowa Bulletin 333, p. 202.

rolling land, (58 percent as against 62 percent on level land), there is one-third more grassland in the rotation (21 percent as against 16 percent on level land). This tendency is highly desirable from the viewpoint of erosion control. There can be no doubt, however, that the proportion of crop land in intertilled crops is too high, and in grassland, too low, in both topography classes to control erosion effectively.

Permanent pasture in percentage of the farm land is slightly higher on the level (15 percent) than on the rolling land (13 percent), again in contrast with the Iowa Loess area. This is largely due to more bottomland pastures on the more level farms. There is very little permanent upland pasture in the area. It should be determined whether this is due to the fact that there is enough bottomland subject to overflow or bad drainage available to satisfy the need for pasture under existing farming conditions, or to the fact that permanent bluegrass pastures on upland are undependable and low yielding. If the latter be true, land-use adjustments should be confined to balancing crop rotations on uplands rather than to emphasizing the conversion of crop land into permanent upland pastures.

Topography does not seem to influence the livestock system at all, nor is there any significant difference in the level of corn yield between the two topography classes.

The tendencies just described can be attributed mainly to the influence of topography as they appear rather consistently in all size groups and tenure groups.

A peculiar difference between rolling and level land is revealed in the response of crop systems to farm size. Table 2 indicates that the effect of farm size on the intertilled crop acreage seems to work in opposite directions on rolling and on level land. The relative corn acreage decreases on rolling and increases on level land with increasing farm size, both on owner and on tenant farms. Correspondingly, grassland increases on rolling and decreases on level land with increasing farm size. This relation is particularly pronounced on the owner-operated farms on rolling land and the tenant operated farms on level land.

Considering both owner and tenant farms combined, the corn acreage on rolling land shows a normal behavior, i.e., decreasing from 63 to 56 percent of the crop land, while on level land it increases from 57 to 64 percent, with increasing farm size -- i.e. for farms below 141 acres and above 280 acres, respectively. Grassland increases from 18 to 25 percent of crop land on rolling land, and decreases from 17 to 14 percent on level land with increasing farm size.

Table 2. Percentage of Crop Land in Intertilled Crops and Grasses, by Classes of Farm Size, Tenure and Topography

Acres per Farm in	All farms on all land	All farms on Rolling land	All farms on Level land	Owner Operated farms on Rolling land	Owner Operated farms on Level land	Tenant Operated farms on Rolling land	Tenant Operated farms on Level land
Intertilled Crops:							
Below 141 Acres:	61	63	57	60	55	67	65
141-280 Acres :	60	59	61	55	57	65	68
Above 280 Acres:	58	56	64	54	59	64	71
All sizes	59	58	62	55	57	63	70
Grassland							
Below 141 Acres:	18	18	17	18	18	17	16
141-280 Acres :	18	19	16	22	19	13	12
Above 280 Acres:	22	25	14	26	18	20	8
All sizes	19	21	16	23	19	18	10

The explanation may be due at least partly to a greater proportion of bottomland on the large level land farms, which is suggested by the fact that the percentage of farm land in permanent pasture is nearly the same in all size groups on rolling land, but on level land it is almost twice as large on the large farms (24 percent) as it is on the small farms (13 percent). Much of the bottomland in this area, however, is heavily cropped to corn.

B. Owner-Operation and Tenancy in Relation to Land Use and Erosion

The influence of land tenure on the character of land use and on erosion is so striking that it cannot fail to arouse serious apprehension and discomfort in the mind of the observer.

For the purpose of analysis, all farms have been considered under three possible types of tenure:

1. owner-operators
2. related-tenants
3. non-related tenants.

This division is made in recognition of the fact that tenancy as a step in the course of inheritance of farm land is definitely of a different character than is tenancy under impersonal and purely commercial landlord tenant relationships. Conclusive evidence of this fact is shown in Table 3, and several other highly significant facts and tendencies regarding the influence of tenure on erosion and farming systems are revealed.

1. Erosion, crop system and livestock enterprises, by classes of tenure. Erosion is more serious on non-related tenant farms (rating 3.17) than on owner and related-tenant farms (2.85 and 2.81, respectively). This holds true even if differences in topography are considered. On farms operated by owners and related tenants, erosion ratings are lower than the respective topography ratings, while farms of non-related tenants have an erosion rating higher than the respective topography rating. In other words, the non-related tenant farms are in a worse state of erosion, both absolutely and relative to their topography, than are the owner and related-tenant farms.

The crop systems found in the various tenure groups offer a partial explanation of this fact. With extraordinary consistency do non-related tenants have a higher proportion of crop land in corn and soybeans (average 66 percent) -- the most erosive crops -- and a lower proportion in grasses and legumes (average 15 percent) -- the soil protecting crops -- than do owners (56 and 21 percent, respectively) and related tenants (56 and 23 percent, respectively). The class similarity in the crop systems used by owners and related-tenants is striking. Both owners and related-tenants also rank higher in the proportion of farm land in permanent pasture (14 and 15 percent, respectively) as compared with non-related tenants (12 percent). This difference is not very significant, however, and indicates, at best, only a slight tendency toward more permanent vegetative cover on owner than on tenant farms.

The livestock systems reflect the differences in crop systems between owner and tenant farms. Numbers of roughage-consuming (mostly cattle) animal units (14 animal units per 100 acres) are invariably much lower on non-related tenant farms than they are on owner farms (23 animal units). This means that the manure base is almost twice as large on the owner farms as it is on tenant farms. The replacement of organic matter through manure application to the soil is a most important measure to reduce erosion losses and to maintain fertility. Observations indicate that the manure is also better cared for and more systematically utilized on owner than on tenant farms. This may well be interpreted as another explanation for the relatively smaller degree of erosion on owner farms.

Table 3. Erosion, Crop System and Livestock Enterprises, by Classes of Tenure

Tenure Classes	Number of Farms	Average Farm Size (Acres)	Rating of Topography	Rating of Erosion	Percentage of Farm Land in Permanent Pasture	Percentage of Crop Land in Corn and Soybeans	Percentage of Crop Land in Small Grain	Percentage of Crop Land in Grasses and Legumes	Animal Units Per 100 acres of Farm Land: Hog (a)	Animal Units Per 100 acres of Farm Land: Roughage (b)	Animal Units Per 100 acres of Farm Land: Total (c)	Pounds of Butterfat Produced
Owners	124	205	2.97	2.85	14	56	22	21	15	23	39	620
Related-tenants	45	197	2.82	2.81	15	56	21	23	11	17	29	536
Non-related tenants	34	222	3.01	3.17	12	66	18	15	11	14	26	394
All Farms	253	209	2.96	2.96	14	59	20	19	13	19	33	526

(a) 5 hogs equal 1 Animal Unit
(b) Includes all roughage-consuming animals, that is, cattle, horses and sheep. 1 mature cow or 1 horse or 7 sheep equal 1 Animal Unit.
(c) Includes poultry. 100 hens equal 1 Animal Unit.

Hog animal units are also higher (15 A.U. per 100 acres) on owner farms than they are on tenant farms (11 A.U. per 100 acres). The reason for this is largely a matter of grain supplies. Most tenants deliver one-half of their corn crop as rent to the landlord. Even related tenants who usually follow the set-up of owner farms rather than of non-related tenant farms, do not have any more hogs than the non-related tenants do. With regard to roughage-consuming livestock, the related tenants stand midway between the owner and the non-related tenants, which probably is due, at least to some extent, to a smaller labor supply on related-tenant farms where the operator is more likely to be a younger man without much help from grown-up sons and daughters, and to inadequate credit sources for tenants in general.

The intensity of the livestock enterprise as a whole is about 50 percent greater on owner (39 A. U. per 100 acres) than on non-related tenant farms (26 A. U. per 100 acres), in terms of animal units as well as in terms of butterfat produced per 100 acres (620 and 394 pounds, respectively). This indicates that the owner farm organization is of a much more stable and long-time character than is the non-related tenant farm organization. This stability of tenure and the possibility of long-time planning of farming operations on owner farms facilitates definitely the conservation of the land resources.

The great similarity between owner and related tenant farms in so many significant particulars holds not only for the averages of all owner and related-tenant farms, but is retained if the farms are sub-classified into topography and farm size groups, despite the substantial reduction in the number of cases in each class subsequent to such a sub-grouping. This consistency lends much weight and justifies considerable reliance upon the conclusions drawn. In fact, it was decided, after careful examination of the data, to combine for the further analysis the farms operated by owners and related-tenants into one class, in contrast with farms operated by non-related tenants as the other class. The presentation of the data for all three groups would be redundant and would add little, if anything, to the analysis of the respective problems. In the following discussion, therefore, the term "owner" includes related-tenants, and the term "tenants" refers to non-related tenants only, unless otherwise stated.

2. Frequency distribution of farms. It has been shown that tenants (non-related to landlords) follow, on the average, a considerably more exploitive crop system than do owners. The percentage of crop land in corn averages 66 percent on tenant as compared with 56 percent on owner farms. These averages, however, take on more mean-

ing if they are supplemented by the frequency distribution of farms in the various classes of crop systems presented in Table 4.

The modal group of tenant farms falls in the range of 65 to 75 percent of crop land in corn, while the modal group of owner farms falls in the range of 50 to 55 percent corn. Both groups comprise about one-fourth of the total number of owners and tenants. The contrast between owners and tenants is particularly pronounced in the extreme ranges. Almost one-fourth of all tenants have more than 75 percent of their crop land in corn, as compared with only 6 percent of all owners. Only one-twentieth of all tenants have less than 50 percent in corn, as compared with one-fourth of all owners.

This frequency distribution is highly important from the viewpoint of soil conservation policy. It means that the average relative corn acreage minimizes the difficulties which arise through the tenancy problem in bringing about crop adjustments. It means that if 50 to 55 percent should be considered a maximum limit of corn in proportion to crop land, 85 percent of all tenants would have to make adjustments, as compared with only 50 percent of all owners. And of those farms which have to adjust, the tenant farms have to take a much greater cut in corn acreage than do the owner farms.

The frequency distribution of owner and tenant farms by classes of grassland accentuates the seriousness of the tenancy problem in relation to soil conservation in a similar way. Forty-one percent of all tenants have less than 10 percent of their crop land in grasses and legumes, as compared with only 15 percent of all owners.

3. Farm size in relation to erosion, crop system and livestock enterprises, by classes of tenure. The farm size is one of the most important factors affecting the organization of the farm enterprise. Particularly where the operator and his family furnish by far the largest part of the labor available on the farm, more labor is available per acre on a small farm than on a large farm. This relatively higher labor supply on small farms results in more intensive farming. That is to say, with an increasing amount of labor available per acre, the labor-intensive enterprises tend to constitute an increasing proportion of the enterprises which make up the farm business. The intensity of farming largely determines the land use and its effect on soil deterioration.

Erosion seems to be slightly more serious on the smaller than on the larger farms, although this tendency in the Tarkio Creek

Table 4. Distribution of Owner and Tenant Operated Farms by Percentage of Crop Land in Intertilled Crops and Grasses and Legumes

Percentage of Crop Land in	All Farms			Owner-Operated Farms			Tenant-Operated Farms		
	Number	Percentage in Class: Non-cumulated	Percentage in Class: Cumulated	Number	Percentage in Class: Non-cumulated	Percentage in Class: Cumulated	Number	Percentage in Class: Non-Cumulated	Percentage in Class: Cumulated
Intertilled Crops									
30 - 34.9	2	1	1	2	1	1	--	--	--
35 - 39.9	7	3	4	7	4	5	--	--	--
40 - 44.9	13	5	9	13	8	13	--	--	--
45 - 49.9	24	9	18	20	12	25	4	5	5
50 - 54.9	50	20	38	42	25	50	8	10	15
55 - 59.9	43	17	55	26	15	65	17	20	35
60 - 64.9	36	14	69	23	14	79	13	15	50
65 - 74.9	48	19	88	25	15	94	23	27	77
75 -100.0	30	12	100	11	6	100	19	23	100
Total	253	100	---	169	100	---	84	100	---
Grasses and legumes									
0 - 4.9	33	13	13	10	6	6	23	28	28
5 - 9.9	26	10	23	15	9	15	11	13	41
10 - 14.9	53	21	44	34	20	35	19	23	64
15 - 19.9	36	14	58	26	15	50	10	12	76
20 - 24.9	39	15	73	32	19	69	7	8	84
25 - 29.9	27	11	84	20	12	81	7	8	92
30 - 34.9	24	10	94	18	11	92	6	7	99
35 - 39.9	8	3	97	7	4	96	1	1	100
40 -100.0	7	3	100	7	4	100	--	--	--
Total	253	100	---	169	100	---	84	100	

area is not as pronounced as it seems to be in the Iowa Loess area.[6/] With the exception of the smallest (below 100 acres) and the largest (above 400 acres) size groups which fall out of line, the erosion rating decreases with increasing farm size, from 2.94 to 2.76. This slight tendency could not be adjudged significant were it not for the fact that it appears fairly consistently throughout the subclasses of tenure (and of topography). Here again tenant farms show without exception higher erosion than owner farms. In fact, all size groups of tenant farms, with one exception, have higher erosion ratings than the most eroded group of owner farms.

The crop system possibly affords a partial explanation of the tendency toward more erosion on smaller farms. Because of the clear-cut difference in the crop systems used by owners and by tenants, the farm size factor should be studied for these two tenure groups separately.

Corn and soybeans on owner farms decrease slightly but definitely (from 58 to 54 percent of crop land) with increasing farm size, while on tenant farms the tendency seems to run in the opposite direction. Except in the smallest and the largest size groups, the proportion of crop land in corn and soybeans increases from 66 to 76 percent with increasing farm size.

Regarding grass land in rotation, too, the tendencies on owner and tenant farms seem to run in opposite directions. In the four size groups ranging from 100 to 400 acres, the grassland on owner farms increases from 16 to 24 percent, while on tenant farms it decreases from 18 to 9 percent of the crop land. The reason the smallest and largest size groups show a "non-conforming" type of behavior is probably due in part to the smallness of the sample, and to special circumstances prevailing on the farms of extreme and uncommon sizes.

The livestock enterprise reveals the influence of farm size more strongly than does the crop system. Here again, owner and tenant farms must be considered separately, as they seem to respond differently to variations in farm size in some instances.

Roughage-consuming livestock (cattle, horses and sheep) per 100 acres on owner farms increase (from 17 to 25 animal units) with increasing farm size, while there is no definite response to farm size in this type of livestock on tenant farms. Hogs, on the other hand, decline consistently with increasing farm size on owner farms (from 17 animal units to 12 animal units per 100 acres) while

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Table 5. Farm Size in Relation to Erosion, Crop System and Livestock Enterprises by Classes of Tenure

Acres per Farm	Number of Farms			Erosion Rating			Percent of Crop Land in Corn and Soybeans		
	Owners(a)	Tenants(b)	All	Owners	Tenants	All	Owners	Tenants	All
Below 100	17	7	24	2.81	3.12	2.90	58	68	61
100 - 140	30	12	42	2.84	3.15	2.94	58	66	61
141 - 180	58	32	90	2.82	3.13	2.93	56	66	60
181 - 280	35	22	57	2.61	3.03	2.78	56	68	61
281 - 400	17	5	22	2.74	2.84	2.76	55	76	60
Above 400	12	6	18	3.25	3.45	3.35	54	60	57
All Sizes	169	84	253	2.84	3.17	2.96	56	66	59

Acres per Farm	Percent of Crop Land in Grass			Roughage Consuming Animal Units per 100 Acres			Hog Animal Units per 100 Acres		
	Owners	Tenants	All	Owners	Tenants	All	Owners	Tenants	All
Below 100	23	13	20	17	14	16	17	7	14
100 - 140	16	18	17	21	13	19	15	10	14
141 - 180	21	12	18	20	15	18	15	10	13
181 - 280	20	12	17	23	13	19	13	12	13
281 - 400	24	9	21	21	10	19	13	15	14
Above 400	25	21	24	25	17	21	12	12	12
All Sizes	22	15	19	22	14	19	14	11	13

Acres per Farm	Pounds of Butterfat Produced per 100 Acres			Corn Yield per Acre		
	Owners	Tenants	All	Owners	Tenants	All
Below 100	1142	894	1069	41	37	40
100 - 140	1103	606	954	44	39	42
141 - 180	779	554	699	45	40	43
181 - 280	549	447	510	45	40	43
281 - 400	271	319	259	47	39	45
Above 400	300	109	217	45	44	45
All Sizes	600	394	526	45	41	43

(a) Owners and related tenants.
(b) Non-related tenants.

they increase on tenant farms (from 7 animal units in the smallest to 15 animal units in the second largest size group). It is noteworthy that owner farms are consistent in keeping substantially more roughage-consuming livestock than tenant farms, which corresponds with the higher proportion of grassland, and accounts in part for the lower degree of erosion. The tenants on larger sized farms go more heavily into hog production, while the owner-operators go into beef cattle production. This results logically from the lack of stability of tenure on the tenant farms, and possibly, to some extent, from a lack of credit available to tenants.

Butterfat production per 100 acres serves as a measure of the relative intensity of the dairy enterprise in the various farm classes. A consistent decline in dairying occurs with increasing farm size on both owner and tenant farms (from over 1000 pounds to about 200 pounds of butterfat per 100 acres). In every size class, however, more butterfat is produced on owner farms than on tenant farms.

Considering the relation between the dairy enterprise and the erosion problem it is significant, generally speaking, that dairying is one of the most labor-intensive enterprises, and at the same time one that yields high returns of manure. Hence, the dairy enterprise on a small family-sized farm does two things to facilitate erosion control: (1) it diverts labor from the land to the livestock, thereby reducing the acreage of intertilled crops from what it would be without dairying; and (2) it produces a relatively large supply of barnyard manure which is so essential for keeping up the organic matter content and general fertility of the soil, particularly on a small farm that cannot afford, at least under average Corn Belt conditions, to use extensive grass rotation on all of its crop land.

That <u>corn yields</u> are generally higher on owner than on tenant farms is probably due largely to two factors: (a) more grasses and legumes in the rotation; and (b) more and better preserved manure from the larger cattle enterprise. The greatest difference in yields appears in the 281-400 acre size group (8 bushels), in which there is also the greatest difference in the grassland (owners 24 percent, tenants 9 percent of the cropland), and in the roughage-consuming livestock (owners 21 animal units per 100 acres, tenants 10 animal units per 100 acres).

There is a slight tendency toward higher corn yields in the larger size groups of the owners, while no such tendency appears on the tenant farms. The largest size group of tenant farms, however, has the highest yields together with the highest grassland

and lowest corn acreage, and the highest number of roughage-consuming animal units, of all tenants farms.

The significance of the effects of crop and livestock systems on yields will be discussed later.

C. Types of Leases in Relation to Land Use and Erosion

1. Farms operated by non-related tenants. The mere fact that a piece of land is operated by some other person than the owner does not necessarily cause specific exploitation of the land's resources. It is the attitude of the operator toward the land in general and the farm in particular, his interest in the perpetuation of the farm's productive power, which determines the character of the land use. This attitude and interest in the land are, within limits, both determined and reflected by the type of lease under which a tenant rents a farm.

Because of the general continuity of attitude and interest between owners and related-tenants, only the farms operated by tenants not related to the landlord shall be considered at this time.

Over two-thirds (68 percent) of all the non-related tenants operate under a crop-share lease, about one-fourth (27 percent) have stock-share, and the rest (5 percent) have cash rent leases, as is shown in Table 6. This distribution of lease types alone indicates tenure conditions which are out of adjustment with the agricultural opportunities of the area. These opportunities lie in the direction of livestock farming, instead of cash grain farming. The crop share lease, however, automatically engenders a cash grain type-of-farming and is definitely unsuited to livestock farming.

The effect of the types of leases upon the crop system is striking. The crop-share tenants have 70 percent of their crop land in corn and soybeans, and only 10 percent in grasses and legumes, as compared with 57 and 23 percent, respectively, on stock-share farms. That is to say, on the stock-share farms there is 19 percent less corn, 130 percent more grasses and legumes, and, in addition, 27 percent more permanent pasture than on the crop-share farms.

These differences in crop systems are reflected in the livestock enterprise. Stock-share tenants keep 19 roughage-consuming animal units per 100 acres as compared with 11 kept on crop-share farms, which means 73 percent more roughage-consuming livestock on stock-share than on crop-share farms.

It is interesting to note that the stock-share tenants follow practically the same crop systems that the owner-operators do

Table 6. Types of Leases in Relation to Erosion, Crop Systems and Livestock Enterprises on Non-related Tenant Farms

Type of Lease	Number of Farms	Average Farm Size (Acres)	Ratings of Topography	Ratings of Erosion	Percentage of Farm Land in Permanent Pasture	Percentage of Crop Land in Corn and Soybeans	Percentage of Crop Land in Grasses and Legumes	Animal Units per 100 Acres of Farm Land: Hog	Roughage	Total (a)	Pounds of Butterfat Produced per 100 acres of Farm Land
Crop-Share	57	181	2.84	3.17	11	70	10	8	11	20	497
Stock-Share	23	340	3.22	3.17	14	57	23	14	19	34	252
Cash Rent	4	120	3.22	3.33	7	69	15	18	14	34	505
All Types	84	222	3.01	3.17	12	66	15	11	14	26	394

(a) Includes poultry animal units.

(see Table 3), and that their livestock system, too, comes fairly close to that of the owners. The latter have, however, even more roughage-consuming livestock (23 animal units per 100 acres) than do the stock-share tenants (19 animal units). This is explained by the considerably larger size of the stock-share farms (340 acres) as compared with the owner farms (205 acres).

Since crop-share tenants usually deliver about half of the grain crop to the landlord, their farming system is, by this very token, practically of a cash grain type. They have not only fewer cattle, but fewer hogs as well, when compared with stock-share tenants or owner-operators.

Although crop-share tenants produce about twice as much butterfat (497 pounds per 100 acres) as do stock-share tenants, they are still considerably below the owners and related tenants in this respect. The low butterfat production on stock-share farms (252 pounds per 100 acres) indicates that the farms are definitely of the beef cattle type. Their average size (340 acres) is almost twice that of the crop-share farms (181 acres).

The average erosion rating is the same on crop-share and stock-share farms, but the relative degree of erosion, taking into consideration differences in topography, is decidedly greater on crop-share than on stock-share farms. The erosion rating is higher than the topography rating on crop-share farms, while it is lower on stock-share farms. This means that the soil resources are more seriously exploited under the crop-share than under the stock-share lease.

The data on cash rent farms are of little, if any significance, because of the smallness of the sample. There are only 4 cases, and with the exception of the farm size, all other factors show wide variations between these farms. This appears to be logical as the cash rent lease is "neutral" with respect to the farming system. Inherently, the cash rent lease, if coupled with reasonable assurance of long-time occupancy and of fair adjustment of rentals in case of crop failure or violent price fluctuations, is more desirable from the viewpoint of land-use adjustment since the tenant has freer hand to practice soil conservation and reaps the full benefit of his efforts to improve soil productivity.

A more general use of the stock-share lease, which facilitates soil conservation more than any other type of lease, is unlikely to occur in the near future and in the high-tenancy areas because of the necessity for a relationship of confidence between landlord and tenant, and because of the major contributions in management made by the landlord. These are two quite typical characteristics

of the stock-share tenure arrangement. Hence if changes which would facilitate more conservational farming systems and land uses should be suggested in the types of leases commonly used, it probably would have to be in the direction of more cash rent leases with adequate provisions for rental adjustments, and fewer crop-share leases.

2. Farms operated by related-tenants. The strong influence which the type of lease has upon crop and livestock systems used by non-related tenants (see Table 6), appears to be considerably mitigated on related-tenant farms, although the various types of leases seem to affect crop and livestock systems in the same direction for both groups. The farming systems followed by related-tenants, in general, approach quite closely those of owner operators, regardless of the type of lease used.

In contrast with the non-related tenants, related-tenants more commonly use the stock-share lease, as indicated in Table 7. Almost half of the farms operated by related-tenants (47 percent) are rented under stock-share leases as compared with 27 percent of the non-related tenant farms, 40 percent under crop-share leases as compared with 68 percent of non-related tenant farms, and 13 percent under cash rent leases. This popularity of the stock-share lease on related-tenant farms is easily explained by the benefit which the young tenants get through the managerial and financial contribution of the older and experienced father or other relative under the stock-share lease, and by the mutual confidence usually prevailing between family members.

Yet, even on related-tenant farms, despite the close relationship and congruity of interest of tenant and landlord, crop-share leases seem to result in a somewhat more exploitive use of the land than do stock-share leases, according to the erosion ratings of 2.99 and 2.69, respectively. Again, the first is higher than its respective topography rating, the second lower.

There is little difference between these two types of leases in the proportion of the crop land in corn. The proportion of grassland, however, is considerably larger on the stock-share (27 percent of crop land) than on the crop-share farms (19 percent). This difference in grassland between stock-share and crop-share farms, to be sure, is much larger on non-related tenant than on related-tenant farms. On farms operated by non-related tenants, those under stoch-share lease have 130 percent more grass in the rotation than do those under a crop-share lease; on related-tenant farms the corresponding proportion is only 42 percent. There is also less difference in the livestock system, between stock-share and crop-share related-tenants (Table 6).

Table 7. Types of Leases in Relation to Erosion, Crop Systems and Livestock Enterprises on Related-Tenant Farms

Type of Lease	Number of Farms	Average Farm Size (Acres)	Ratings of Topography	Ratings of Erosion	Percentage of Farm Land in Permanent Pasture	Percentage of Crop Land in Corn and Soy-Beans	Percentage of Crop Land in Grasses and Legumes	Animal Units Per 100 Acres of Farm Land: Hog	Roughage	Total	Pounds of Butterfat Produced per 100 Acres of Farm Land
Crop-Share	18	164	2.86	2.99	13	57	19	11	16	29	519
Stock-Share	21	226	2.79	2.69	15	55	27	14	20	34	540
Cash Rent	6	195	2.84	2.82	19	58	16	15	24	40	655
All Types	45	197	2.82	2.81	15	56	23	13	19	33	548

As there are only six cases of related-tenants renting for cash, the conclusions that could be drawn from the data of such a small sample would not be very reliable. These cash rent farms are more intensive livestock farms than are even the stock-share farms. In spite of the lowest grassland acreage the degree of erosion is not above average.

D. Effect of Crop and Livestock Systems on Corn Yields under Various Types of Tenure

The reduction in corn acreage is one of the most important requirements for soil conservation and erosion control in the rolling sections of the Corn Belt. It has been shown (Table 4) that owners are following a more conservational crop system with less corn and more grasses and legumes than are tenants, and that corn yields on owner farms, largely on account of more legumes in the rotation and more manure applications, are consistently higher than on tenant farms. The question then arises: to what extent do the higher corn yields offset the lower acreage? This question, obviously, is of great economic concern to the individual farmer as well as to Corn Belt agriculture as a whole.

1. Comparison of owner and tenant farms. In the Tarkio Creek area, the owner farms have 15 percent less corn acreage, 10 percent higher corn yields, and a 7 percent lower corn production per 100 acres of crop land than do the tenant farms, as shown in Table 8. Hence, the owners actually produce less corn than do the tenants, but the production reduction is only half as great as the acreage reduction. Considering the fact that the grass and legume acreage (per 100 acres of cropland) is 47 percent larger on owner than on tenant farms, it is conceivable that the aggregate feed production per 100 acres of crop land is only insignificantly decreased or, perhaps, even slightly increased by a moderate corn acreage reduction, a substantial legume acreage increase, and an increase in crop yields due to a larger manure base, resulting from more cattle kept per 100 acres of farm land and a better preservation and utilization of the manure. According to Table 8, there are 57 percent more roughage-consuming animal units per 100 acres of farm land on the owner than on the tenant farms.

If corn acreage is reduced drastically, perhaps 30 percent or more, the aggregate feed production over an entire area (that is, under the prevailing level of managerial ability) will probably tend to decline, unless much of the reduced corn acreage is replaced by alfalfa, or much of the increased legume acreage is plowed under for green manure. Such a large shift to alfalfa, however, is difficult to accomplish and may not be economically feasible. Moreover, the

Table 8. Corn Acreage Yield and Production, and Grass Acreage per 100 Acres of Crop Land, and Roughage-Consuming Animal Units, on Tenant and Owner Farms

Comparative Factors	Tenant Farms(a)	Owner Farms(b)	Percentage difference between Tenant and Owner Farms
Corn Acres per 100 Acres of crop land	66	56	- 15
Average corn yield (bu. per acre)	41	45	+ 10
Corn production on 100 A. crop land	2706	2520	- 7
Grass and legume acres per 100 A. crop land	15	22	+ 47
Roughage animal units per 100 acres	14	22	+ 57

(a) Operated by non-related tenants.
(b) Operated by owners and related-tenants.

growing of legumes for green manure purposes only has both physical and economic limitations. No doubt a given change in the crop system in the direction of less corn and more legumes will produce different results in aggregate feed production and individual crop yields, according to the live-stock pattern to be erected over the new crop system. The effect of the new livestock system on yields and aggregate feed production will largely be determined by its effect on the manure base of the average farm.

2. Comparison of Crop-Share and Stock-Share Tenant Farms. It has just been shown that the effect of more conservational crop systems (less corn and more legumes) and a larger manure base (due to more roughage-consuming livestock) on corn yields of owner as compared with tenant-farms, partly offset the corn acreage reduction with respect to bushels of corn produced and, through the larger amount of roughage, tended to keep the aggregate feed unit production of owner farms up to that of the tenant farms (see Table 8).

A comparison of corn acreage, yield, and production between stock-share and crop-share tenants reveals that the 26 percent higher corn yield of the stock-share farms more than offsets the 18 percent smaller corn acreage, actually resulting in 3 percent more bushels of corn produced per 100 acres of crop land on stock-share than on crop-share farms, as shown in Table 9. Since there is but little difference

Table 9. Corn Acreage, Yield and Production, and Grass Acreage per 100 Acres of Crop Land, and Roughage-Consuming Animal Units, on Non-Related Tenant Farms with Crop-Share and Stock-Share Leases

Comparative Factors	Crop-Share Leases	Stock-Share Leases	Percentage difference between Crop-Share and Stock-Share Leases
Corn acres per 100 acres of crop land	70	57	- 18
Average corn yields (bu. per acre)	37	47	+ 26
Corn production on 100 A. crop land	2600	2670	+ 3
Grass and legume acres per 100 A. crop land	10	23	+130
Roughage animal units per 100 acres	11	19	+ 73

in the small grain acreage between the two tenancy classes, the stock-share farms have almost the whole feed unit production of about 13 acres in addition to what the crop-share farms produce per 100 crop acres. Hence, the stock-share farms with only 57 percent of their crop land in corn, but with 23 percent in grasses and legumes, and with 73 percent more roughage-consuming animal units, produce slightly more corn and considerably more aggregate feed units per 100 crop acres than do the crop-share farms.

Much caution, however, is needed in evaluating these facts from the viewpoint of soil conservation policies. For instance, the conclusion that, in general, a reduction of 18 percent in corn acreage and an increase of 130 percent in grasses and legumes would result in an increase of 26 percent in average corn yields and in a substantial increase of aggregate feed production would hardly be warranted. In the first place, most of the stock-share farms regularly buy feed from outside and thereby indirectly "import" plant nutrients. General feed purchases of similar dimensions for the area as a whole are not likely to occur under an adjustment program, particularly if feed grains are to be reduced in other areas also. Secondly, it is safe to assume that the average level of management on stock-share farms is considerably higher than on crop-share farms, and probably even higher than the average for all farms in the area. It is characteristic of the stock-share lease arrangements that the land-

lord is an experienced livestock raiser or feeder, and takes active part in the management of the farm business. This, too, is not amenable to generalization for an entire area with a high percentage of land rented under crop-share leases and farmed predominantly under a corn-hog type of farming.

3. Comparison of grain selling and grain buying farmers. The inter-relationship between crop and livestock systems, and their combined effect upon the degree of erosion and the state of soil productivity, have been discussed previously. One important factor, however, has not as yet been considered -- the sale or purchase of feed grains.

Obviously, a steer does not care whether his corn was grown on the farm or purchased from outside. But it does make a difference with regard to the aggregate amount of annually available manure and plant nutrients on the farm land. Grain purchases represent imports, grain sales exports of plant nutrients, and, in many cases, of soil fertility.

The 253 farms surveyed were divided into three groups on the basis of grain sold or purchased. The farms on which 10 percent or more of the production was purchased were termed grain deficit farms; those on which less than 10 percent of their production was purchased or less than 10 percent was sold were termed self-sufficient farms; and those farms on which 10 percent or more of their grain production was sold were termed grain surplus farms. On this basis 144 of the 253 farms, or 60 percent, were grain surplus farms. At least 10 percent of the grain on these 144 farms was either sold off the farm or delivered to the landlord. The average amount of grain removed (both sold and delivered to the landlord) from these farms, however, amounted to over half (51 percent) of their corn production and over one-fourth (28 percent) of their oats production. (See Table 10).

Only 36 farmers, (15 percent of the 253) normally buy grain to the extent of over 10 percent of their production amounting on the average to 50 percent of their corn and 3 percent of their oats production. Seventy-three farmers neither sell nor buy more than 10 percent of their grain production. Only one-half (53 percent) of the grain-selling farmers, in contrast with four-fifths (83 percent) of the grain-buying farmers, are owner-operators (including related-tenants).

The grain-buying farmers keep almost twice as many livestock, both hogs and roughage-consuming animals, per 100 acres of farm land as do the grain selling farmers. The grain sufficing farms fall in between these two groups.

Table 10. Grain Sales and Purchases in Relation to Tenure, Erosion, Crop Systems and Livestock Enterprises (a)

Classes of Farms	Number of Farms: Total	Number of Farms: Percent owner operated (b)	Percentage of Production Sold (-) or Bought (+): Corn	Percentage of Production Sold (-) or Bought (+): Oats	Rating of: Topography	Rating of: Erosion	Percentage of Crop Land in: Corn and Soybeans	Percentage of Crop Land in: Grasses and Legumes	Animal Units per 100 Acres of Farm Land: Hog	Animal Units per 100 Acres of Farm Land: Roughage
Grain-selling farms	144	53	- 51	- 28	2.90	3.05	63	16	10	15
Grain-buying farms	36	83	+ 50	+ 3	3.02	2.88	57	22	19	28
Grain-sufficing farms	73	86	--	- 6	2.93	2.87	54	24	14	21

(a) Sales (-) include landlord's share removed from the farm. Grain-selling or buying farms include all farms normally selling or buying more than 10 percent of their production.
(b) Includes related tenants.

The grain-buying farms have 10 percent less corn acreage and 37 percent more grassland per 100 acres of crop land than do the grain-selling farms. This difference in crop system, together with the difference in the manure base resulting from the respective livestock systems, may largely account for the lower degree of erosion on the grain-buying than on the grain-selling farms. It should be noted that the degree of erosion is considerably lower on the grain-buying farms in spite of the fact that their topography rating is higher than that of the grain-selling farms.

The erosion rating of the grain-sufficing farms which are 86 percent owner-operated (including related tenants) and have the smallest corn and the largest grass acreage of all three groups, is the lowest in absolute terms, but is higher than that of the grain-buying farms if the differences in topography are taken into account. In the grain sufficing group the erosion rating is only 0.06 points lower than the corresponding topography rating, while in the grain-buying group, it is 0.2 points lower. This fact may be partly explained by the greater density of roughage-consuming livestock on the grain-buying farm resulting in a larger manure base and smaller erosion loss.

The significance of the data in Table 10 is enhanced by the fact that the tendencies revealed by these figures appear quite consistently throughout the sub-classes by farm size and topography, even though the number of cases in each sub-class is materially reduced by this process of sub-grouping.

Comparing the crop systems of grain-buying and grain-selling farms, it is revealed in Table 11 that the grain-buying farms have 10 percent less corn and 37 percent more grasses per 100 acres of crop land than do the grain-selling farms. The decrease of 10 percent in corn acreage on the grain-buying farms, however, is more than offset by an increase of 15 percent in corn yields, resulting in a corn production per 100 crop acres which is 4 percent larger than that on grain-selling farms. There are 3 acres less of small grains and 6 acres more of grasses and legumes per 100 acres; consequently the aggregate feed production on the grain-buying farms is greater than that on the grain-selling farms by an equivalent of, roughly, 3 acres of grass and legumes.

The corn supply available for feed is more than 3 times as large on the grain-buying as on the grain-selling farms; however the number of roughage-consuming animal units per 100 acres of farm land is 87 percent, and of hog animal units 50 percent greater on the grain-buying than on the grain-selling farms.

Table 11. Corn Acreage, Yield, Production and Supply, and Grass Acreage, Per 100 Acres of Crop Land, and Animal Units, on Grain Selling, Buying and Sufficing Farms

Comparative Factors	Grain-Selling Farms	Grain-Buying Farms	Percentage difference between Grain-Selling and Grain-buying farms	Grain Sufficing Farms	Percentage difference between Grain-selling and Grain-Sufficing farms
Corn acreage per 100 acres of crop land	63	57	- 10	54	- 14
Corn Yield (Bushels per Acre)	41	47	+ 15	46	+ 12
Corn Produced per 100 acres of crop land	2583	2679	+ 4	2484	- 4
Corn Sales(-) or Purchases(+) per 100 crop acres	- 1317	+ 1329		--	
Corn Supply available for feed	1266	4008	+ 216	2484	+ 96
Grass and legume acres per 100 acres crop land	16	22	+ 37	24	+ 50
Roughage animal units per 100 acres	15	28	+ 87	21	+ 40
Hog animal units per 100 acres	10	15	+ 50	14	+ 40

Comparing grain-sufficing and grain-selling farms, (Table 11) a 14 percent lower corn acreage in the former group is not completely offset by the 12 percent higher corn yields in the latter group. Hence the corn production is about 4 percent lower on the grain-sufficing than on the grain-selling farms. The grasses and legume acreage on the crop land is greater by 50 percent on the grain-sufficing than on the grain-selling farms.

These comparisons suggest a net effect of the grain purchases on crop yields. The grain-buying farms show a smaller corn acreage reduction, and a smaller grass acreage increase, over the respective acreages on grain selling farms than do the grain-sufficing farms. Yet, the grain-buying farms show a greater increase in corn yields than do the grain-sufficing farms over those on the grain-selling farms. Assuming no significant differences in the levels of managerial ability in these three groups of farms, this larger increase in corn yields on the grain-buying farms can be attributed to the greater livestock density and the resulting larger manure base made possible through the purchase of grains from outside.

4. Summary and interpretation. The effect of crop and livestock systems on corn yield and production (per 100 acres of crop land) is extremely important from the viewpoint of agricultural land-use adjustment. Under what conditions and to what extent will a reduction in corn acreage be offset by a resulting yield increase? This question is particularly vital to farms of small economic size operating on a narrow margin. Any reduction in their volume of business would probably be unbearable for the operators.

Table 12 shows that less corn per 100 acres of crop land is produced on owner and grain-sufficing farms than on tenant and grain-selling farms, respectively. On the other hand, stock-share and grain-buying farms produce more bushels of corn, despite a smaller acreage, than do crop-share and grain-selling farms, respectively. In all four comparisons, however, it is safe to assume that the volume of business is larger on the farms with the smaller corn acreage, due to the more strongly developed livestock enterprise and its effect on soil productivity.

The comparison of the difference between grain-selling and grain-buying farms on the one hand, with the difference between farms operated under crop-share and stock-share leases on the other, reveals a much stronger contrast between stock-share and crop-share than between grain-buying and grain-selling farms. This appears to be logical, since the crop share farms have considerably more corn, less grass and less roughage-consuming livestock than the grain-

Table 12. Comparisons of the Effect of Crop and Livestock Systems on Corn Yield and Production Between Groups of Farms Classified by Tenure and by Feed Supply (a)

Comparative Factors	Percentage difference in			
	Tenant and Owner Farms	Grain Selling and Gr. Sufficing Farms	Crop-Share and Stock-Share Farms	Grain-Selling and Grain-Buying Farms
Corn acres per 100 acres of crop land	- 15	- 14	- 18	- 10
Corn Yield (bushels per acre)	+ 10	+ 12	+ 26	+ 15
Corn produced per 100 acres crop land	- 7	- 4	+ 3	+ 4
Grass acres per 100 acres of crop land	+ 47	+ 50	+130	+ 37
Roughage A.U. per 100 acres crop land	+ 57	+ 40	+ 73	+ 87

(a) This table represents an abstract of Tables 8, 9, and 11.

selling farms, while stock-share farms are quite similar to grain-buying farms in these important particulars.

These facts may suggest that whether or not a shift toward less corn and more grasses in the rotation will result in a maintained or a decreased corn production will largely depend upon two factors: (a) the size of the shift, and (b) the character and intensity of the newly adjusted livestock system, assuming, of course, no change in the prevailing level of managerial capacity, and no legume crops plowed under for green manure.

There can be no doubt, however, that under certain conditions even substantial shifts in crop acreages in the indicated direction may actually result in a larger production of corn as well as of feed units in the aggregate. This is particularly well illustrated by the comparison between the crop-share and the stock-share farms. (Table 12) Since such an increase in feed production despite a reduction in corn acreage, according to the above findings, seems to be coupled with an increase in the volume of livestock production, the total volume of business on a given farm could ac-

tually be increased by the use of conservational rotations over what it is under the present exploitive crop system. This adjustment, however, involves far-reaching changes in the whole farm organization, and with respect to rented farms, particularly in the character of the landlord-tenant relationships.

III. Tenure Patterns and Landlord-Tenant Relationships

A. Distribution of Farms by Classes of Tenure

In studying the effect of tenure on erosion, crop systems, and various phases of farm organization, the information used pertains to 1933 and several preceeding years in order to assure some measure of normalcy in the relationships of the factors analyzed. The year 1934 was exceptional in three important respects: the weather, the corn-hog program, and the Soil Erosion Service. Information on land use for this year, therefore, would indicate very abnormal conditions.

Regarding the system of land tenure and the characteristics of landlord-tenant relationships, 1935, the year of the survey, yields adequate information, and for this part of the study the data for this year are used.

The change in the general tenure pattern from 1933, according to Table 13, amounts to a decrease in owner-operators of 9 percent, and an increase in related tenants of 15 percent, and in non-related tenants an increase of 5 percent. This indicates that the period of liquidation had not as yet spent itself in 1933, but was still going on in 1934-35. The fact, however, that 7 out of 11 farms which changed from owner to tenant operation went into the hands of relatives of the landlord, suggests that the greater part of this decrease in owner and increase in tenant farms was due to retirement of the previous owner, rather than to a transfer of operatorship under financial distress.

In 1935, 55 percent of all the farms surveyed were operated by tenants. According to the 1935 Census, 54 percent of the farms in Montgomery county and 48 percent in Page county were tenant operated. The sample, therefore, is representative with respect to the extent of tenancy in the area.

Over one-third of the tenants (37 percent) are family-related to the landlord. These related tenants, in general, do not

Table 13. Distribution of Farms by Major Classes of Tenure, 1935 and 1933

Classes of Tenure	1935		1933		Change from 1933	
	Number of farms	Percent	Number of farms	Percent	Number of farms	Percent
Owners	113	45	124	49	- 11	- 9
Related Tenants	52	20	45	18	+ 7	+15
Non-related "	88	35	84	33	+ 4	+ 5
Total	253	100	253	100	--	--

face the many intricate problems involved in landlord-tenant arrangements. The emphasis in the analysis of the tenancy situation, therefore, will be focussed largely upon the non-related tenants.

B. Distribution of Types of Leases by Classes of Landlords

The relative popularity of the various lease types with the various classes of landlords is indicative of some characteristic personal relationships and attitudes of the two parties concerned. Landlords related to their tenants hold only 22 percent of all crop-share leases, but hold 54 percent of all stock-share leases, as is shown in Table 14. Most of the cash rent leases are held by related landlords also. Considering all leases granted by related landlords, almost half of the leases (48 percent) are of the stock-share type, about one-third (35 percent) are crop-share, and the rest (17 percent) cash rent leases. This distribution of lease types indicates three characteristic features of the relationship between family-related landlords and tenants, all of which are essential for successful farming under a stock-share lease: (1) mutual confidence, (2) interest in livestock farming, and (3) security of occupancy of the farm by the tenant.

Non-related landlords hold 78 percent of all crop-share leases, and 46 percent of all stock-share leases. Corporate landlords lease their farms only on crop-share. Little weight can be given to the distribution of cash rent leases because of the small number of cases available. Most of the farms rented for cash, however, are operated by related tenants. A fair adjustment of cash rentals under conditions of fluctuating prices or crop failures is much easier to obtain between father and son than between a banker in Chicago and an unrelated tenant. Legal provisions for methods of ad-

Table 14. Distribution of Types of Leases by Classes of Landlords, (1935)

Landlord	Crop-Share Lease		Stock-Share Lease		Cash Rent Lease		All Leases	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Related	18	22	25	54	9	82	52	37
Non-related private	40	48	21	46	2	18	63	45
Corporate	25	30	--	--	-	--	25	18
All Types	83	100	46	100	11	100	140	100

Table 15. Occupation of Landlord, by Types of Leases, (1935)

Occupation of Landlord	Crop-Share Lease		Stock-Share Lease		Cash Rent Lease		All Leases	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Active Farmer	15	18	14	31	2	18	31	22
Retired Farmer	14	17	20	44	-	--	34	24
Business Man	10	12	7	15	1	9	18	13
Professional Man	6	7	3	6	1	9	10	7
No occupation	7	9	2	4	1	9	10	7
Estate	6	7	--	--	6	55	12	9
Credit Corporation	25	30	--	--	-	--	25	18
Total	83	100	46	100	11	100	140	100

justing cash rentals must be developed and generally accepted if the cash rent lease is to be used more commonly. The trust-worthiness and competence of the tenant is also an important prerequisite for the leasing of farms on a cash rent basis.

The influence of the occupation of the landlord on the type of lease used is indicated in Table 15. Of all stock-share leases, 75 percent are held by retired or active farmers, which suggests that most of the landlords of stock-share rented farms are in close contact with the tenant in matters of management. Twenty out of thirty-four retired farmers, or almost 60 percent, lease their farms on a stock-share basis. The landlords of crop-share rented farms are fairly evenly distributed over the various occupations. Corporations hold the greatest proportion (30 percent) of all crop-share leases. It is noteworthy that more than one-half (55 percent) of all cash rent leases are used by estates, that is, under relatively stable tenure conditions.

How active a part a landlord can take in the management of his farm depends a good deal on the distance between the landlord's residence and the farm. Since the various lease types imply various degrees of activity in management on the part of the landlord, the residence of the landlord can be expected to have some influence on the type of lease used.

The landlords of all stock-share farms, with one exception, are living within 25 miles of their farms and are classified as "resident" landlords, as shown in Table 16. About one-fourth of the private landlords of crop-share as well as cash rent farms are absentee landlords. Apparently, the stock-share lease is not suitable for absentee landlords. Considering all lease types used by private landlords, 84 percent of all leases are held by resident and 16 percent by absentee landlords. This may seem to indicate a rather small extent of absentee landlordism, and it very likely is, compared with some northern sections of the State. If corporations are included in the absentee landlord group, however, the proportion of absentee landlords increases to 31 percent of all rented farms covered by the survey. (Of the 25 farms owned by corporations, 12 are held by national, 12 by State, and 1 by local institutions).

None of the absentee landlords using crop-share or stock-share leases is related to the tenant. Of the three absentee landlords using cash rent leases, two are so related.

Needless to say, absentee landlordism, as a rule, does not facilitate the establishment of well balanced and efficient landlord-tenant relationships, particularly under short-term leases on a crop-

Table 16. Residence of Private Landlords in Relation to Types of Leases

Residence of Provate Landlords	Crop-Share Lease		Stock-Share Lease		Cash Rent Lease		All Lease Types	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Resident (a)	44	76	45	98	8	73	97	84
Absentee	14	24	1	2	3	27	18	16
Total	58	100	46	100	11	100	115	100

(a) All landlords living within a radius of 25 miles of the farm are classified as resident.

share basis. The long-term cash rent lease, with proper provisions for rent adjustments in case of violent price fluctuation or crop failure, is inherently the most adequate arrangement between an absentee landlord and his tenant.

C. Length of Farm Occupancy in Relation to Types of Landlords and Types of Leases

The number of years a tenant stays on the same farm ("length of occupancy") gives some indication of the relative stability of tenancy. The length of occupancy is quite often reflected in the methods of land use and of farming in general, in the attitude of the tenant toward the land, toward the farm as a place to live, and toward the community. From the viewpoint of land policy, and considering the history of Middle Western agriculture and the condition of the land, a greater stability of land occupancy is highly desirable, and factors promoting a higher degree of stability of occupancy should be utilized and supported in their effectiveness under a land-use program.

1. Distinction between length and security of occupancy. This statement, however, needs to be qualified. It is not stability per se, but stability for the purpose of facilitating a balanced economic and social development of farm life, toward which our efforts should be aimed. The stabilization of the present tenure pattern would, in some areas, mean the perpetuation of a serious maladjustment. The fundamental problem is to stimulate a long-time personal interest of both tenant and landlord in the land, the farm home, and the community. In order to allow such an attitude to develop, dras-

tic changes in the present tenure system may be necessary in many areas. Not only may the mobility of tenants have to be reduced, but the number of tenant-operators as well. Certain classes of landlords may have to be discouraged from owning farm land, others may have to be helped in fulfilling their functions as landlords more efficiently.

The length of farm occupancy by tenants is not altogether a dependable measure of stability of tenure. The element of security of occupancy is of extreme importance for a balanced growth of rural life and for the conservation of the land resources. A non-related tenant may operate the same farm for many years under a one-year lease without becoming attached to the land, the farm home and the community, because he has no security of occupancy for more than one year, and shuns any long-time commitments and activities. This must be kept in mind in interpreting data on length of farm occupancy by tenants.

One-half of all non-related tenants were on their present farms less than five years, while only one-third of all related tenants have been operating their present farms for a similarly short period, as shown in Table 17. In terms of averages, the non-related tenants have been on the present farms around 7 years, the related tenants around 8 years. The fact that the average non-related tenant occupies the same farm almost as long as the related tenant may be surprising if the drastic difference in crop and livestock systems between these two tenant classes is remembered. The lack of difference in the average length of occupancy supports the above statement that it is the security of occupancy rather than the length of occupancy which determines the type of farming. The family tenant has often grown up on the farm he now operates, and when he ceases to be a tenant, usually remains an owner-operator on the same farm. Most of the non-related tenants, on the other hand, have no assurance that the lease will be renewed next year. It is noteworthy, nevertheless, that 28 percent of all non-related tenants have occupied the present farms for over 10 years, a relatively high proportion, considering the mobility of tenants in Iowa. There is every reason to believe that if they had known from the beginning that they could stay on the farm for so long a period, they would have taken better care of the land, and would have planned their farming operation ahead for more than one year at a time. There are indications that a relatively high degree of stability of tenants prevails in the Tarkio Creek area. For instance, the average length of occupancy for all tenants is about 8 years in the Tarkio Creek area, as compared with 4 years in the Big Creek area in south-central Iowa.

Table 17. Length of Farm Occupancy in Relation to Types of Landlords

Length of Tenant Occupancy (a)	Landlord Related to Tenant		Landlord Non-Related to Tenant		All Tenants	
	Number	Percent	Number	Percent	Number	Percent
Less than 5 years	18	34	44	50	62	45
5 - 9 years	16	31	19	22	35	25
10 - 14 years	8	15	9	10	17	12
15 - 19 years	5	10	8	9	13	9
More than 19 years	5	10	8	9	13	9
Total	52	100	83	100	140	100

(a) Years of tenant on present farm.

Table 18. Length of Farm Occupancy in Relation to Types of Leases

Length of Tenant Occupancy	Crop-Share Lease		Stock-Share Lease		Cash Rent Lease		All Tenant Farms	
	Number	Percent	Number	Percent	Number	Percent	Number	Percent
Less than 5 years	42	51	17	37	3	27	62	45
5 - 9 years	17	20	13	28	5	48	35	25
10 - 14 years	8	10	7	15	2	18	17	12
15 - 19 years	9	11	3	7	1	9	13	9
More than 19 years	7	8	6	13	-	--	13	9
Total	83	100	46	100	11	100	140	100

2. Length of occupancy in relation to types of leases. The relation between the type of lease and the length of occupancy is indicated in Table 18. Under the crop-share lease a considerably greater proportion (51 percent) of tenants remained less than 5 years on the farm than was true under the stock-share lease (37 percent). Under the cash rent lease the mobility of tenants seems to be even lower than under the stock-share lease, but the number of cases is too small to permit of generalization.

In order to isolate the influence of types of landlords and types of leases on the length of occupancy, the average length of occupancy both by types of landlords and leases is shown in Table 19. Here, a further distinction is made between private non-related landlords and corporate landlords.

Table 19. Years of Operatorship and Years of Farm Occupancy of Present Tenants, by Types of Landlords and Types of Leases

Tenure Class by Type of Landlord and Lease	Number of Farms	Present Tenant: Years as operator (average)	Present Tenant: Years on present farm (average)	Percentage of time of operatorship spent on present farm
Landlord Related to Tenant				
Crop-Share Lease	18	12	8	67
Stock-Share Lease	25	12	9	75
Cash Rent Lease	8	14	8	57
Private Landlord not Related:				
Crop-Share Lease	40	13	5	38
Stock-Share Lease	21	22	9	45
Cash Rent	3	10	5	50
Corporate Landlord				
Crop-Share Lease (a)	25 (b)	19	11	58
All Tenants				
Crop-Share Lease	83	15	8	53
Stock-Share Lease	46	17	9	53
Cash Rent Lease	11	13	7	53
All Leases Average	140	15	8	53

(a) The corporations own these farms 3 years on the average.
(b) On 6 of these 25 farms the previous owner-operators stayed as tenants, on 7 the previous tenants were retained, on 9 the previous owner-operators were displaced by new tenants, and on 3 the previous tenants were displaced by new tenants.

The type of lease seems to have little effect on the length of occupancy of related tenants, as could be expected, but it has a very marked effect on the length of occupancy of non-related tenants of private landlords. In the latter groups, the average occupancy under crop-share leases is 5 years as compared with 9 years under stock-share leases.

The average occupancy of tenants of corporate landlords, all operating under a crop-share lease, is 11 years. This is explained by the fact that 6 of the 25 tenants were previously owner-operators of the same farms, and 7 of the 25 tenants had previously been tenant-operators of the same farms. In half of the cases, therefore, the change in ownership did not cause a change in occupancy. The respective corporations owned these farms for 3 years on the average.

If the time the present tenant has been a farm operator on this or any other farm ("length of operatorship") is considered in connection with the length of occupancy, interesting facts are revealed. Among related-tenants, again, the lease type does not seem to bear any relation to the length of operatorship. Among non-related tenants of private landlords, however, the length of operatorship of stock-share tenants is almost twice as great as that of crop-share tenants. This seems to indicate that unrelated landlords lease their farms on a stock-share basis preferably to older and experienced operators.

The average occupancy of stock-share tenants is 9 years, both under related and non-related landlords. The non-related stock-share tenant, however, has spent less than half of his years as operator on the present farm, while the related tenant has spent three-fourths of his length of operatorship on the present farm.

The greatest degree of mobility of tenants is found among crop-share tenants of non-related private landlords. The average length of operatorship of these tenants is 13 years, the average occupancy is 5 years, which means in general terms that they have spent only 38 percent of their time as operators on the present farm, as compared with 75 percent for stock-share related-tenants, who constitute the most stable group of tenants.

3. Length of occupancy in relation to occupations of landlords. There are significant differences in the length of farm occupancy by tenants according to the various occupations of landlords, as shown in Table 20. The shortest average occupancy (3 years) is found with crop-share tenants of landlords engaged in business, the longest with stock-share tenants of landlords with no occupation (16 years), followed by landlords engaged in professions (12 years).

Table 20. Length of Farm Occupancy of Tenants, by Occupation of Landlords and Types of Leases (1935)

Occupation of Landlord	Crop-Share Leases	Stock-Share Leases	Cash Rent Leases	All Types of Leases
	Tenants' average years on present farm			
Active farmer	5	9	6	7
Retired farmer	8	7	-	8
Business	3	10	7	6
Professional	9	12	3	10
No occupation	5	16	8	7
Estate	7	-	8	8
Credit Corporations	11	-	-	11
Average	8	9	7	8

Considering the fact that the majority of both the business and professional landlords have never occupied their farms themselves and own these farms primarily as commercial investments, it seems noteworthy that the business man as landlord has the greatest rate of turn-over of tenants, while the professional man as landlord seems to give his tenant a considerable security of occupancy.

The length of occupancy of tenants of active or retired farmers cannot be interpreted as indicating the rate of turn-over of tenants, because they themselves have previously occupied these farms in many cases, and the tenants often become owners after a period of years. Therefore, the length of occupancy of related tenants depends largely on internal family conditions, and usually does not run much over 10 years.

D. Changes in the Tenure Pattern Over a Ten-Year Period (1926-1935)

The development of agriculture and rural community life in a given area is necessarily influenced by the degree of stability of land tenure. Unfortunately, information on the history of individual farms for several decades is extremely scant. Census data concerning tenure are incomplete and crude. The survey in the Tarkio Creek area attempts to throw some light on the stability of farm tenure.

Of the 113 farms which were owner-operated in 1935, 88 percent have been operated by owners for more than 10 years, as shown

in Table 21. There have been changes in ownership on 14 of these 99 farms, but they were never rented during this period. Fourteen farms, or 12 percent, of all farms now owner-operated changed their status from tenancy to owner-operation since 1925.

But this does not represent a net change in the indicated direction. During the same period, 68 farms changed from owner-operation to tenancy, which means a net increase in tenancy of 54 farms, or 21 percent of all 253 farms surveyed, during the last 10 years -- a very remarkable change for such a relatively short period of time. It means that 10 years ago only one-third of the farms (86 out of 253) were tenant-operated, as compared with over one-half (140) in 1935.

Table 21. Stability of the Tenure Pattern Over a 10-year Period (1926-1935)

Farms	Farms: Number	Percentage of: Total	Subtotal
Total	253	100	--
Owner-operated (as of 1935)	113 (a)	45	100
More than 10 years	99 (b)	39	88
Less than 10 years	14	6	12
Tenant-operated (as of 1935)	140	55	100
More than 10 years	72	28	51
Less than 10 years	68 (c)	27	49

(a) 22 of the 113 owner-operators rented additional land in 1935.

(b) 14 of these farms have changed ownership, but have been owner-operated throughout the last 10 years.

(c) 11 of the 68 farms changed from owner-operatorship to tenant-operatorship during the two years 1934 and 1935.

Changes in tenure during the period of 1926 to 1935 are shown more in detail in Table 22. Of the 68 farms which changed from owner-operatorship to tenancy, 63 percent were rented under a crop-share lease, 31 percent under a stock-share, and 6 percent under a cash rent lease. The latter two types of leases were used predominantly by related landlords. Forty-three percent of the "new" tenants are related-tenants, 31 percent are tenants of non-

Table 22. Changes in Tenure During the Period 1926-1935, by Types of Leases and Types of Landlords

Types of Lease and Types of Landlord	Number of Farms			
	Total	Private Landlords: Related	Private Landlords: Non-rel.	Corporate Landlords
From Owner-operatorship to Tenancy				
Present type of lease:				
Crop-Share	43	9	16	18
Stock-Share	21	16	5	--
Cash Rent	4	4	--	--
All Types of Leases	68	29	21	18
From Tenancy to Owner-Operatorship				
Former type of lease:				
Crop-Share	8	1	7	--
Stock-Share	3	2	1	--
Cash Rent	3	2	1	--
All Types of Leases	14(a)	5(b)	9(b)	--
Net Change from Owner-Operatorship to Tenant-Operatorship	54	24	12	18
Changes of Lease Types within Tenancy				
From crop-share to stock-share lease	3	--	3	--
From crop-share to cash rent lease	1	1	--	--
From stock-share to crop-share lease	5	2	--	3
From cash rent to stock-share lease	1	--	1	--
All changes of lease types	10	3	4	3

(a) In 4 cases the present owner-operator is the former tenant (2 former stock-share, 2 former cash rent tenants). In 6 cases the present owner-operator is the former landlord (5 former crop-share, 1 former cash rent landlord). In 4 cases the present owner-operator had no connection with farm before.

(b) Refers to type of landlord previous to the change to owner-operatorship.

related private landlords, and 26 percent are tenants of corporations.

Although a 10-year period is relatively short from the viewpoint of land tenure developments, a fairly balanced tenure pattern could be expected to show approximately the same number of farms shifting from owner to related tenant operatorship as the number shifting from related tenant to owner-operatorship during a ten-year period. This would hold if tenancy were exclusively a step in the ladder to farm ownership. Our data show, however, that about six times as many farms changed from owner to related-tenant operatorship (29 farms) as did from related-tenant to owner-operatorship (5 farms). This fact may in part be due to an exceptionally high retirement rate of farmers during the late 'twenties on the one hand, and an exceptionally low rate of transfer of title to the related-tenants on the other.

The depression certainly is one of the reasons for the low rate of title transfers. The extremely low farm prices and high interest rates and other fixed charges made it very difficult for family tenants to pay off other heirs and satisfy sundry claims prior to taking over the title to the farm. It is quite likely that farms will not be transferred from father to son at the same rate as they were in the past, because many a father has not acquired enough wealth to enable him to retire, and the son has not accumulated enough savings to make a down-payment on the farm. This means that the average length of related-tenant operatorship will probably be greater after the depression than it was before.

Whatever the reasons may be for the disproportionate increase in tenancy, it remains a fact that the tenure pattern is seriously out of balance. Considering further that savings are much more quickly wiped out during a depression than they can be built up again from earnings during recovery, it appears likely that it will take considerably more than ten years for this excess number of tenant farms to go back to owner-operatorship, unless some carefully designed measures of public action effectively facilitate such a desirable reversion.

Studying the change from tenant to owner-operatorship more in detail, it is revealed that in only 4 of the 14 cases the present "new" owner was the former tenant. Two of these former tenants operated the farm under a stock-share, two under a cash rent lease, before they became owners. The absence of crop-share leases on these farms is at least noteworthy.

In 6 of the 14 cases, the present "new" owner was the former landlord. This may be more specifically a result of the depres-

sion when some landlords engaged in urban occupations lost their jobs or could no longer live on their rental share from the farm and decided to operate their farms themselves. The fact that more of the "new" owner-operators were the former landlords than the former tenants can hardly represent a normal situation. The conspicuous predominance of crop-share leases on these formerly rented farms is, again, at least noteworthy.

In the remaining 4 of the 14 cases, the present "new" owner-operators had no previous connections with the farm. This means that during the 10-year period there were as many farmers from outside buying the farms as there were tenants becoming owners of their respective farms without moving.

Of the 72 farms operated by tenants during the last 10 years (see Table 21), the type of lease was changed on 10 farms, as indicated in Table 22. Four farms changed from crop-share or cash rent to stock-share, while 5 changed from stock-share to crop-share leases. The cash rent leases gained 1 from the crop-share, and lost 1 to the stock-share leases. No strong trend toward a specific lease type seems to emerge from these changes. It should be noticed, however, that 3 of the 5 "new" crop-share leases lost from the stock-share groups are held by corporate landlords. Insurance companies use the crop-share leases almost exclusively. This change in lease type, therefore, is an incident to the change in ownership rather than an indication of dissatisfaction with the stock-share lease. It should be further noticed that all changes in lease types on farms owned by non-related private landlords represent a shift away from crop-share or cash rent to stock-share leases. (Table 22)

In general, the changes in the tenure pattern during the last ten years indicate an aggravating tenancy problem. Table 23 shows that the number of owner-operated farms has decreased by 32 percent. The increase in the number of farms rented under crop-share leases was 77 percent, which is considerably more than the increase in either stock-share or cash rent farms.

Considering these facts in the light of the previous discussion on the effect of tenancy in general and the crop-share lease in particular upon the land resources, it becomes apparent that no land-use policy can avoid facing this issue of dealing with a trend in tenure which is truly antagonistic to the objectives of land-use adjustments.

Table 23. Comparison of the Tenure Patterns in 1926 and 1935

Tenure Pattern	1926		1935		Percentage Change from 1926 to 1935
	Number	Percent	Number	Percent	
Owner operated farms	167	66	113	45	- 32
Crop-share farms	47	19	83	33	+ 77
Stock-share farms	29	11	46	18	+ 59
Cash rent farms	10	4	11	4	+ 10
All farms	253	100	253	100	